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December 22, 1999

VIA EXPRESS MAIL NO. EL417458255US

BOX NEW PATENT APPLICATION

Assistant Commissioner for Patents

Washington, D.C. 20231

RE: Patent Application for METHOD, APPARATUS AND SYSTEM FOR PROVIDING
MULTIPLE QUALITY OF SERVICE CLASSES TO SUBSCRIBERS IN A NETWORK

Inventor: Petersson, et al.

Our File No.: 64645-1000

Dear Sir:

Enclosed for filing are the following papers relating to a METHOD, APPARATUS AND SYSTEM
FOR PROVIDING MULTIPLE QUALITY OF SERVICE CLASSES TO SUBSCRIBERS IN A
NETWORK, Petersson, et al., inventors:

1. Patent Application, Specification and informal drawings;
2. Fee Calculation Sheet;
3. Assignment and Assignment Recordal Sheet;
4. Declaration and Power of Attorney;
5. Checks in the amount of \$1,594.00 and \$40.00 to cover the respective filing fees; and
6. Return Postcard.

Please file the above-referenced documents and return the date-stamped postcard to the undersigned.
It is believed that no additional fee is due. However, if this is incorrect, the Commissioner is hereby
authorized to charge any fees due which may be required by this paper to Deposit Account No. 07-
0153. Thank you for your assistance. Should you have any questions, please call me.

Respectfully submitted,

GARDERE & WYNNE, L.L.P.

Daniel F. Perez

DFP:DJC:rjc

Enclosures

JC526 U.S. PTO
09/469913
12/22/99

Attorney Docket No. 64645-1000
Patent Application
Docket No. P11785-XUSW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR UNITED STATES PATENT

METHOD, APPARATUS AND SYSTEM FOR
PROVIDING MULTIPLE QUALITY OF SERVICE CLASSES
TO SUBSCRIBERS IN A NETWORK

INVENTORS

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VIA EXPRESS MAIL EL417458255US ON 12/22/99

**METHOD, APPARATUS AND SYSTEM FOR
PROVIDING MULTIPLE QUALITY OF SERVICE CLASSES
TO SUBSCRIBERS IN A NETWORK**

TECHNICAL FIELD OF THE INVENTION

The present invention relates generally to telecommunications and more particularly to a method, apparatus and system for providing multiple quality of service classes to subscribers in a network.

BACKGROUND

Without limiting the scope of the present invention, this background of the present invention is described in connection with an asynchronous transfer mode ("ATM") network and more specifically with a Global System for Mobile communication ("GSM").

The popularity, complexity and scope of wireless communication networks have increased dramatically over the last few years. As a result, network owners and service providers are looking for ways to provide consumers or subscribers with new ways to apply wireless technology to their every day business and personal life. Moreover, wireless customers have become more sophisticated in their use of wireless technology and their expectation of competitive services at competitive prices.

For example, some customers want and are willing to pay for high-speed wireless data transmission using satellites communications. Other customers are not. As a result, customers are interested in having the option to choose from different transmission bandwidths, call routing priorities, security levels and other quality of service options.

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What is needed is a method, apparatus and system for providing multiple quality of service classes to subscribers in a network.

SUMMARY OF THE INVENTION

5 The present invention provides a method, apparatus and system for providing multiple quality of service classes to subscribers in a network. More specifically, the present invention determines a subscriber's quality of service information by using a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes, and stores the subscriber's quality of service information in a visitor location register where the subscriber is currently registered.

10 In addition, the present invention receives an attach request at a visitor location register and sends an update location request from the visitor location register to a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes. The update location request is then sent from the database to a home location register. In response, an update location result is sent from the home location register to the database. The present invention then determines a subscriber's quality of service information

using the database and modifies the update location result to include the subscriber's quality of service information. The modified update location result is sent to the visitor location register where the subscriber's quality of service information is stored.

Alternatively, the present invention receives an attach request at a visitor location register and sends an update location request from the visitor location register to a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes. The present invention then determines a subscriber's quality of service information using the database and sends a first message from the database to the visitor location register, wherein the first message contains the subscriber's quality of service information. The subscriber's quality of service information is stored in the visitor location register and the visitor location register sends a second message to the database, wherein the second message acknowledges receipt of the first message. The update location request is then sent from the database to a home location register and a update location result is sent to the visitor location register.

The present invention also provides an apparatus having a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes, a code segment for determining a subscriber's quality of service information using the database, and a code segment for sending the subscriber's quality of service information to a visitor location register where the subscriber is currently registered.

In addition, the present invention provides an apparatus having a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes, a code segment for determining a subscriber's quality of service information using the database, a code segment for receiving an update location request from a visitor location register and sending the update location request to a home location register, a code segment for receiving an update location result from the home location register, a code segment for modifying the update location result to include the subscriber's quality of service information, and a code segment for sending the modified update location result to the visitor location register.

Similarly, the present invention provides an apparatus having a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes, a code segment for determining a subscriber's quality of service information using the database, a code segment for sending a message to a visitor location register, wherein the message contains the subscriber's quality of service information, and a code segment for receiving an update location request from the visitor location register and sending the update location request a home location register.

The present invention also provides a system having a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes, a visitor location register coupled to the database via a communication link, a code segment coupled to the database for determining a subscriber's quality of service information using the database, a code segment coupled to the database for sending the subscriber's quality of service information to the visitor location register, and a code segment coupled to the visitor location register for storing

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the subscriber's quality of service information in the visitor location register.

Other features and advantages of the present invention shall be apparent to those of ordinary skill in the art upon
5 reference to the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the invention, and to show by way of example how the same may be carried into effect, reference is now made to the detailed description of the invention along with the accompanying figures in which corresponding numerals in the different figures refer to corresponding parts and in which:

Figure 1 depicts a block diagram illustrative of a mobile telecommunications network in accordance with a preferred embodiment of the present invention;

Figure 2 depicts a block diagram illustrative of a satellite telecommunications network in accordance with a preferred embodiment of the present invention;

Figure 3 depicts a signaling sequence illustrative of a mobile telecommunications network in accordance with a preferred embodiment of the present invention; and

Figure 4 depicts a signaling sequence illustrative of a mobile telecommunications network in accordance with an alternative embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

While the making and using of various embodiments of the present invention are discussed in detail below, it should be appreciated that the present invention provides many applicable inventive concepts which can be embodied in a wide variety of specific contexts. The specific embodiments discussed herein are merely illustrative of specific ways to make and use the invention and do not delimit the scope of the invention.

Referring to Figure 1, a block diagram illustrative of a mobile telecommunications network 20 in accordance with a preferred embodiment of the present invention is shown. Mobile telecommunication networks provide service to customers, subscribers or terminals 30 through the use of antennas, such as 22, 24, 26 and 28. These transmit and receive antennas 22, 24, 26 and 28 typically include a base station controller and a base transceiver station collectively referred to as a base station system. These base station systems are defined and arranged in cells 32, 34, 36 and 38. Each cell 32, 34, 36 or 38 covers a geographical region in which a customer 30 can access the services of the mobile telecommunications network 20.

A group of cells 32, 34, 36 and 38 are connected to and controlled by a mobile switching center ("MSC") or switch 40 that performs the necessary routing of calls and services. Depending on the number of cells, a wireless network 20 may have several MSCs 40. Integrated within the MSC 40 is a visitor location register ("VLR") 42, which is a database that keeps track of customers, subscribers or terminals 30 within area served by the MSC 40. The VLR 42 is connected to a home location register ("HLR") 44, which is a database that keeps track of subscribers 30 as they move about the network 20. The HLR 44 also maintains service feature information about each subscriber 30. As will be discussed in more detail below, when a subscriber 30 moves into a new area under the control of a MSC, such as 40, the VLR 42 requests the information necessary to route calls to and from the subscriber 30 and implement his or her service features from the HLR 44.

The present invention also includes a database 46 that contains the quality of service information for all subscribers which have subscribed to a specific quality of service class in the network 20. Database 46 contains the MAP/TCAP/SCCP/MTP signaling stack and is placed in the SS7

network between the VLR 42 (SGSN in the GRPS case) and the HLR 44. The quality of service information dictates the transmission quality that the subscriber 30 will be granted at a call setup. This database 46 allows subscribers 30 to
5 choose from multiple quality of service classes, which may include different transmission bandwidth, call routing priority, call security or other service quality parameters.

In operation, the present invention determines a subscriber's 30 quality of service information by using a database 46 containing quality of service information for each
10 subscriber that has subscribed to one of the multiple quality of service classes. The present invention then stores the subscriber's 30 quality of service information in the VLR 42 where the subscriber 30 is currently registered. The
15 subscriber's 30 quality of service information stored in the VLR 42 is used during a call setup to determine a call transmission quality for the subscriber 30.

As a result, the present invention allows a network operator the possibility of defining different quality of
20 service classes by inserting database 46 into a network 20. Thus, the network operator can charge a standard fee for "default" quality of service and charge customers more if they

desire a higher quality of service. As will be described below, the present invention is applicable to satellite networks as well as mobile networks.

Now referring to Figure 2, a block diagram illustrative of a satellite telecommunications network 60 in accordance with a preferred embodiment of the present invention is shown. The satellite telecommunications network 60 includes gateway earth stations 62 which connect to other types of networks, such as an IP network 64 or an ATM network 66, and user terminals 68. Gateway earth stations 62 and user terminals 68 communicate with a satellite 70, which is controlled by a network control center ("NCC") 72 that performs the necessary routing of calls and services. Integrated within the NCC 72 is a VLR 74, which is a database that keeps track of customers, subscribers or terminals within area served by the NCC 72. The VLR 74 is connected to HLR 76, which is a database that keeps track of subscribers as they move about the network. The HLR 76 also maintains service feature information about each subscriber. As will be discussed in more detail below, when a subscriber moves into a new area under the control of a NCC, such as 72, the VLR 74 requests the information necessary to route calls to and from the

subscriber and implement his or her service features from the HLR 76.

5 The present invention also includes a database 78 that contains the quality of service information for all subscribers which have subscribed to a specific quality of service class in the network 60. Database 46 contains the MAP/TCAP/SCCP/MTP signaling stack and is placed in the SS7 network between the VLR 74 (SGSN in the GRPS case) and the HLR 76. The quality of service information dictates the transmission quality that the subscriber will be granted at a call setup. As previously described, this database 78 allows subscribers to choose from multiple quality of service classes, which may include different transmission bandwidth, call routing priority, call security or other service quality parameters.

10
15
20 As a result, the present invention allows a network operator the possibility of defining different quality of service classes by inserting database 78 into a network 60. Thus, the network operator can charge a standard fee for "default" quality of service and charge customers more if they desire a higher quality of service. As will be described

below, the present invention is applicable to satellite networks as well as mobile networks.

Referring now to Figure 3, a signaling sequence illustrative of a mobile telecommunications network in accordance with a preferred embodiment of the present invention is shown. When a subscriber's terminal 30 is turned on or is moved to a BSS 22 controlled by a different MSC 40, the terminal 30 sends an attach request message 102 to the BSS 22, which in turn passes the attach request message 104 to the MSC 40. The attach request 106 is then sent to the VLR 42, which responds by sending an update location request 108 to the database 46, which contains quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes. The database 46 then sends the update location request 110 to the HLR 44.

As previously described, the HLR 44 records the new call routing location (MSC 40) for terminal 30 and sends an update location result 112 to the database 46. The update location result 112 typically contains subscriber data that identifies the service features accessible by the subscriber's terminal 30. The present invention then determines the subscriber's quality of service information using the database 46 and

modifies the update location result 112 to include the subscriber's quality of service information. The modified update location result 114 is sent to the VLR 42 where the subscriber's quality of service information is stored.

5 If the subscriber 30 is not listed in database 46, the subscriber's quality of service information will be set to correspond to a default quality of service class. The rest of the signaling process continues normally. A person skilled in the art would recognize that the previously described
10 signaling sequence is merely an example that can be altered or modified to be applicable any standardized signaling protocol without limiting the scope of the claimed invention.

Now referring to Figure 4, a signaling sequence illustrative of a mobile telecommunications network in accordance with an alternative embodiment of the present
15 invention is shown. When a subscriber's terminal 30 is turned on or is moved to a BSS 22 controlled by a different MSC 40, the terminal 30 sends an attach request message 132 to the BSS 22, which in turn passes the attach request message 134 to the
20 MSC 40. The attach request 136 is then sent to the VLR 42, which responds by sending an update location request 138 to the database 46, which contains quality of service information

for each subscriber that has subscribed to one of the multiple quality of service classes.

The present invention then determines the subscriber's quality of service information using the database 46 and sends a first message 140 to the VLR 42, wherein the first message contains the subscriber's quality of service information. The VLR 42 stores the subscriber's quality of service information and sends a second message 142 to the database 46, wherein the second message acknowledges receipt of the first message 140. The database 46 then sends the update location request 144 to the HLR 44.

As previously described, the HLR 44 records the new call routing location (MSC 40) for terminal 30 and sends an update location result 146 to the VLR 42. The update location result 146 typically contains subscriber data that identifies the service features accessible by the subscriber's terminal 30.

If the subscriber 30 is not listed in database 46, the subscriber's quality of service information will be set to correspond to a default quality of service class. The rest of the signaling process continues normally. A person skilled in the art would recognize that the previously described signaling sequence is merely an example that can be altered or

modified to be applicable any standardized signaling protocol without limiting the scope of the claimed invention.

The embodiments and examples set forth herein are presented to best explain the present invention and its practical application and to thereby enable those skilled in the art to make and utilize the invention. However, those skilled in the art will recognize that the foregoing description and examples have been presented for the purpose of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching without departing from the spirit and scope of the following claims.

CLAIMS

What is claimed is:

1. A method of providing multiple quality of service classes to subscribers in a network, the method comprising the steps of:

determining a subscriber's quality of service information by using a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes; and

storing the subscriber's quality of service information in a visitor location register where the subscriber is currently registered.

2. The method as recited in claim 1, further comprising the step of using the subscriber's quality of service information stored in the visitor location register during a call setup to determine a call transmission quality for the subscriber.

3. The method as recited in claim 1, wherein the subscriber's quality of service information corresponds to a default quality of service class when the subscriber is not listed in the database.

4. The method as recited in claim 1, wherein each quality of service class provides a different transmission bandwidth.

5. The method as recited in claim 1, wherein each quality of service class provides a different call routing priority.

6. The method as recited in claim 1, wherein each quality of service class provides a different level of call security.

7. The method as recited in claim 1, wherein the network is a asynchronous transfer mode network.

8. The method as recited in claim 1, wherein the network is a mobile access network and the visitor location register is integrated in a mobile switching center.

9. The method as recited in claim 1, wherein the network is a satellite network and the visitor location register is integrated in a network control center.

10. The method as recited in claim 1, wherein the subscriber accesses the network with a mobile terminal.

11. The method as recited in claim 1, wherein the subscriber accesses the network through a fixed access terminal.

12. A method of providing multiple quality of service classes to subscribers in a network, the method comprising the steps of:

receiving an attach request at a visitor location register;

sending an update location request from the visitor location register to a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes;

sending the update location request from the database to a home location register;

sending an update location result from the home location register to the database;

determining a subscriber's quality of service information using the database;

modifying the update location result to include the subscriber's quality of service information;

sending the modified update location result to the visitor location register; and

storing the subscriber's quality of service information in the visitor location register.

13. The method as recited in claim 12, further comprising the step of using the subscriber's quality of service information stored in the visitor location register during a call setup to determine a call transmission quality for the subscriber.

14. The method as recited in claim 12, wherein the subscriber's quality of service information corresponds to a default quality of service class when the subscriber is not listed in the database.

15. The method as recited in claim 12, wherein each quality of service class provides a different transmission bandwidth.

16. The method as recited in claim 12, wherein each quality of service class provides a different call routing priority.

17. The method as recited in claim 12, wherein each quality of service class provides a different level of call security.

18. A method of providing multiple quality of service classes to subscribers in a network, the method comprising the steps of:

receiving an attach request at a visitor location register;

sending an update location request from the visitor location register to a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes;

determining a subscriber's quality of service information using the database;

sending a first message from the database to the visitor location register, wherein the first message contains the subscriber's quality of service information;

storing the subscriber's quality of service information in the visitor location register;

sending a second message from the visitor location register to the database, wherein the second message acknowledges receipt of the first message;

sending the update location request from the database to a home location register; and

sending the update location result to the visitor location register.

19. The method as recited in claim 18, further comprising the step of using the subscriber's quality of service information stored in the visitor location register during a call setup to determine a call transmission quality for the subscriber.

20. The method as recited in claim 18, wherein the subscriber's quality of service information corresponds to a default quality of service class when the subscriber is not listed in the database.

21. The method as recited in claim 18, wherein each quality of service class provides a different transmission bandwidth.

22. The method as recited in claim 18, wherein each quality of service class provides a different call routing priority.

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23. The method as recited in claim 18, wherein each quality of service class provides a different level of call security.

24. An apparatus for providing multiple quality of service classes to subscribers in a network, the apparatus comprising:

a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes;

a code segment for determining a subscriber's quality of service information using the database; and

a code segment for sending the subscriber's quality of service information to a visitor location register where the subscriber is currently registered.

25. The apparatus as recited in claim 24, wherein the subscriber's quality of service information corresponds to a default quality of service class when the subscriber is not listed in the database.

26. The apparatus as recited in claim 24, wherein each quality of service class provides a different transmission bandwidth.

27. The apparatus as recited in claim 24, wherein each quality of service class provides a different call routing priority.

28. The apparatus as recited in claim 24, wherein each quality of service class provides a different level of call security.

29. The apparatus as recited in claim 24, wherein the network is a asynchronous transfer mode network.

30. The apparatus as recited in claim 24, wherein the network is a mobile access network and the visitor location register is integrated in a mobile switching center.

31. The apparatus as recited in claim 24, wherein the network is a satellite network and the visitor location register is integrated in a network control center.

32. An apparatus for providing multiple quality of service classes to subscribers in a network, the apparatus comprising:

a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes;

a code segment for determining a subscriber's quality of service information using the database;

a code segment for receiving an update location request from a visitor location register and sending the update location request to a home location register;

a code segment for receiving an update location result from the home location register;

a code segment for modifying the update location result to include the subscriber's quality of service information; and

a code segment for sending the modified update location result to the visitor location register.

33. The apparatus as recited in claim 32, wherein the subscriber's quality of service information corresponds to a default quality of service class when the subscriber is not listed in the database.

34. The apparatus as recited in claim 32, wherein each quality of service class provides a different transmission bandwidth.

35. The apparatus as recited in claim 32, wherein each quality of service class provides a different call routing priority.

36. The apparatus as recited in claim 32, wherein each quality of service class provides a different level of call security.

37. An apparatus for providing multiple quality of service classes to subscribers in a network, the apparatus comprising:

a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes;

a code segment for determining a subscriber's quality of service information using the database;

a code segment for sending a message to a visitor location register, wherein the message contains the subscriber's quality of service information; and

a code segment for receiving an update location request from the visitor location register and sending the update location request a home location register.

38. The apparatus as recited in claim 37, wherein the subscriber's quality of service information corresponds to a default quality of service class when the subscriber is not listed in the database.

39. The apparatus as recited in claim 37, wherein each quality of service class provides a different transmission bandwidth.

40. The apparatus as recited in claim 37, wherein each quality of service class provides a different call routing priority.

41. The apparatus as recited in claim 37, wherein each quality of service class provides a different level of call security.

42. A system for providing multiple quality of service classes to subscribers in a network, the system comprising:

a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes;

a visitor location register coupled to the database via a communication link;

a code segment coupled to the database for determining a subscriber's quality of service information using the database;

a code segment coupled to the database for sending the subscriber's quality of service information to the visitor location register; and

a code segment coupled to the visitor location register for storing the subscriber's quality of service information in the visitor location register.

43. The system as recited in claim 42, wherein the subscriber's quality of service information corresponds to a default quality of service class when the subscriber is not listed in the database.

44. The system as recited in claim 42, wherein each quality of service class provides a different transmission bandwidth.

45. The system as recited in claim 42, wherein each quality of service class provides a different call routing priority.

46. The system as recited in claim 42, wherein each quality of service class provides a different level of call security.

47. The system as recited in claim 42, wherein the network is a asynchronous transfer mode network.

48. The system as recited in claim 42, wherein the network is a mobile access network and the visitor location register is integrated in a mobile switching center.

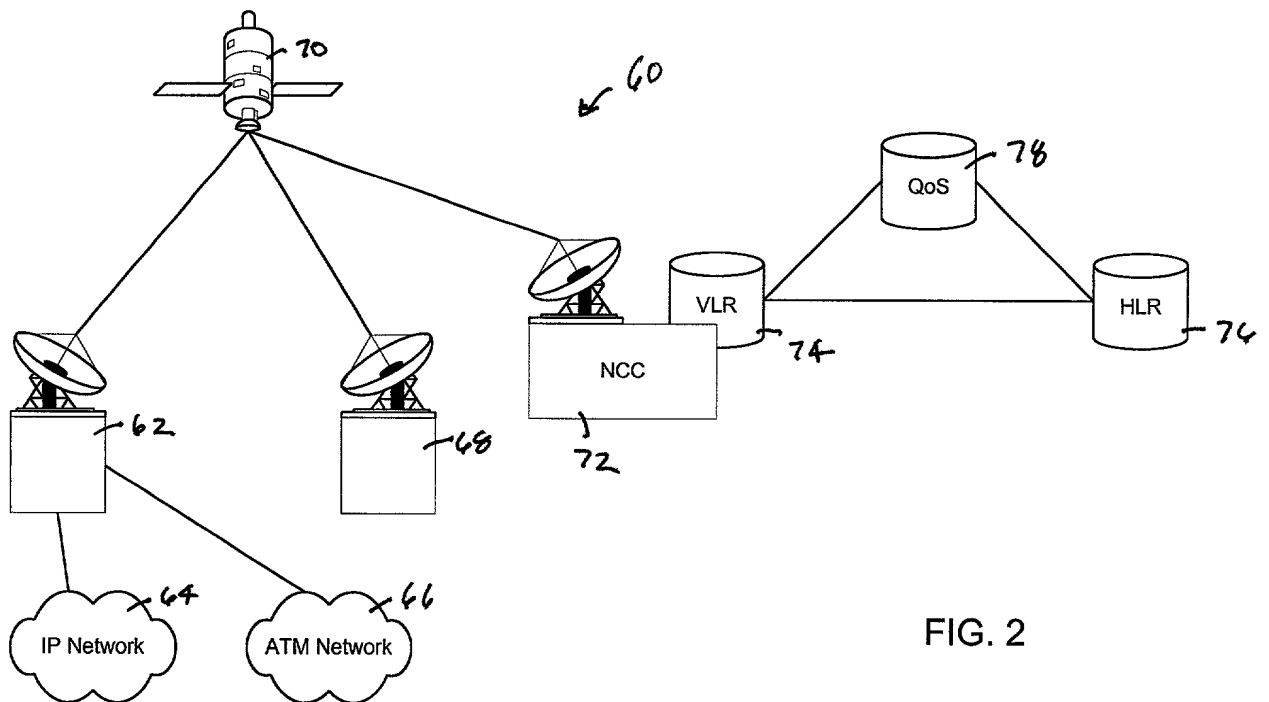
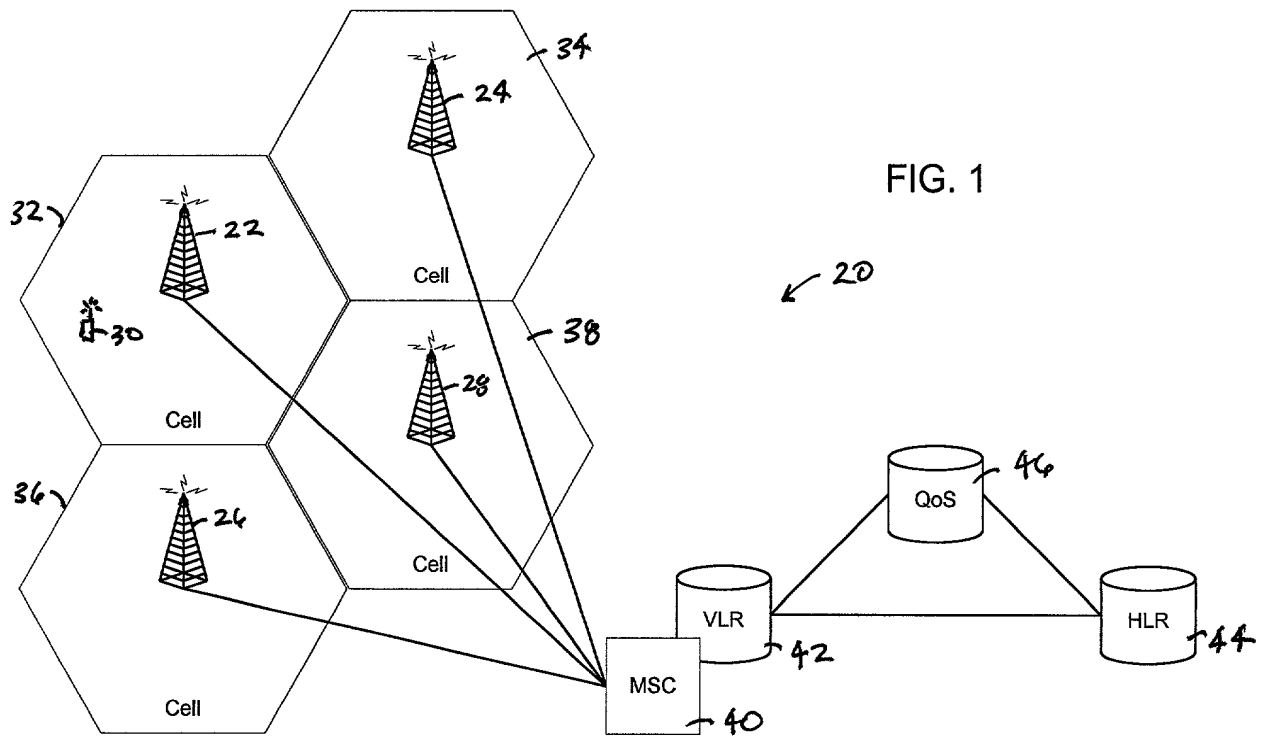
49. The system as recited in claim 42, wherein the network is a satellite network and the visitor location register is integrated in a network control center.

**METHOD, APPARATUS AND SYSTEM FOR
PROVIDING MULTIPLE QUALITY OF SERVICE CLASSES
TO SUBSCRIBERS IN A NETWORK**

ABSTRACT

The present invention provides a system, method and apparatus for providing multiple quality of service classes to subscribers in a network by determining a subscriber's
5 quality of service information by using a database containing quality of service information for each subscriber that has subscribed to one of the multiple quality of service classes, and storing the subscriber's quality of service information in a visitor location
10 register where the subscriber is currently registered.

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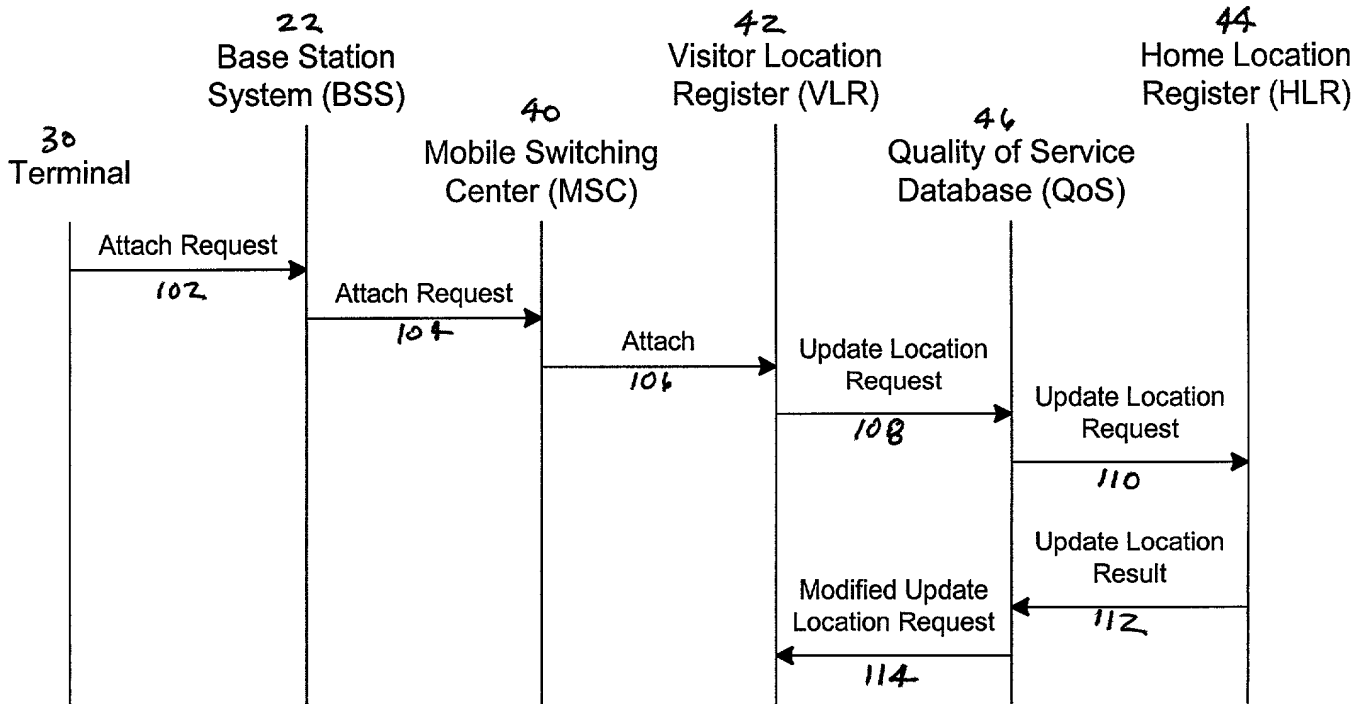


FIG. 3

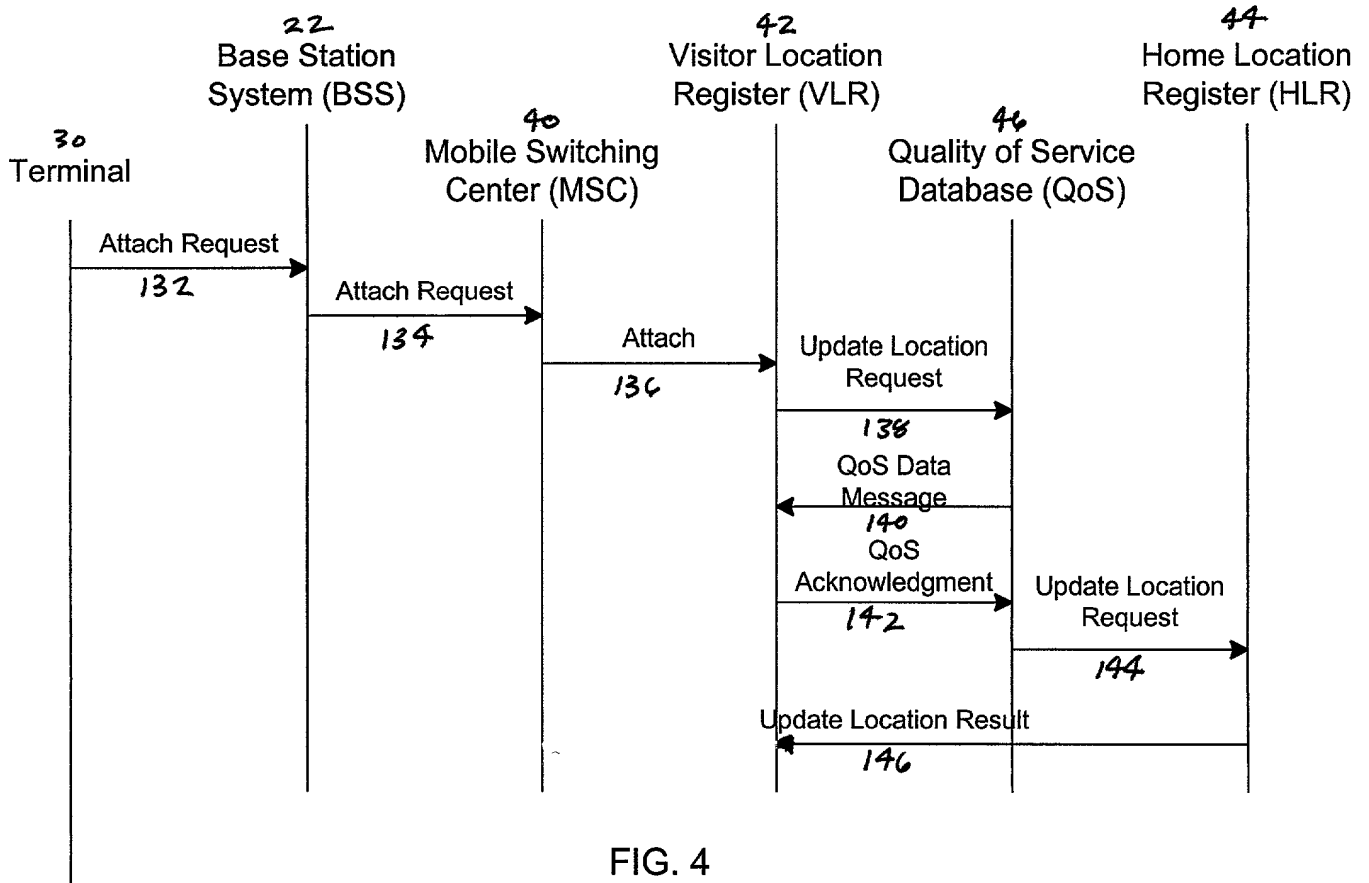


FIG. 4

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Petersson et al.

For: METHOD, APPARATUS AND SYSTEM FOR PROVIDING MULTIPLE
QUALITY OF SERVICE CLASSES TO SUBSCRIBERS IN A
NETWORK

BOX NEW PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

DECLARATION AND POWER OF ATTORNEY

As a below named joint inventor, we hereby declare that:

1. Our residence, post office address, and citizenship are as stated below next to our names.
2. We believe we are the original, first, and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD, APPARATUS AND SYSTEM FOR PROVIDING MULTIPLE QUALITY
OF SERVICE CLASSES TO SUBSCRIBERS IN A NETWORK

3. We have reviewed and understand the contents of the above-identified specification, including the claims.
4. We acknowledge the duty to disclose information which is material to the patentability of this application as defined by Title 37, Code of Federal Regulations, § 1.56.
5. We hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

NONE

We hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

NONE

6. We hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or 365(c) of any PCT International application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, we acknowledge the duty to disclose information which is material to patentability as defined in § 1.56 which became available between the filing date of any prior application(s) and the national or PCT international filing date of this application:

NONE

7. We hereby appoint:

Daniel J. Chalker, Reg. No. 40,552
Edwin S. Flores, Reg. No. 38,453
Marilyn Huston, Reg. No. 37,851
Edward I. Jorgenson Reg. No. 34,194
H. Lisa Koh, Reg. No. 43,725
Todd Landis, Reg. No. 44,200
Philip G. Meyers, Reg. No. 30,478
John W. Montgomery, Reg. No. 31,124
Carol Neilsen, Reg. No. 37,676
Luis Ortiz, Reg. No. 36,230
Daniel F. Perez, Reg. No. 33,755
Kay Lyn Schwartz, Reg. No. 39,020
Theodore F. Shiells, Reg. No. 31,569
Sanford E. Warren, Jr., Reg. No. 33,219
Lawrence R. Watson, Reg. No. 31,891
Lawrence Youst, Reg. No. 38,795

of the firm of GARDERE & WYNNE, L.L.P., our attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, and to file and prosecute any international patent application filed thereon before any international authorities under the Patent Cooperation Treaty;

Send correspondence to: Daniel F. Perez
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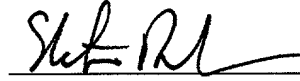
Attorney Docket No. 64645-1000

8. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of Inventor:

Stefan Petersson

Inventor's Signature:



Date:

6/12/99

Residence (City, State):

5809 Charleston
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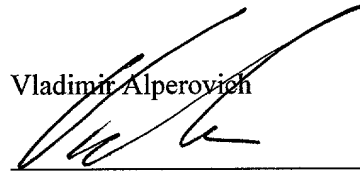
Citizenship:

Sweden

Full name of Inventor:

Vladimir Alperovich

Inventor's Signature:



Date:

Dec 7, 99

Residence (City, State):

18419 Rain Dance Trail
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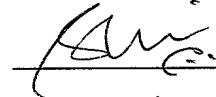
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Date:

12/6/99

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